



Assessment of Adoption of Improved Cassava Processing Technologies in Ibarapa East LGA, Oyo State, Nigeria.

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Abstract

The importance of improved technologies in agricultural processing cannot be overemphasized. This study examined the adoption level of improved cassava processing technologies in Ibarapa East Local Government Area, Oyo State, Nigeria. Multistage sampling procedure was used with well-structured questionnaire to select 190 cassava processors using descriptive statistics to achieve the objectives. The result revealed that the average age of the respondents was 47 years. Majority (90%) of them were married with average household size of 6 persons. The average years of processing experience was 11 years. The result also revealed that more than 60% of the cassava processors did not have extension contact in the last one year. All of the respondents adopted most of the technologies except the fryer and the peeler. Only 7% of the respondents sourced information from extension agents while 27% sourced information from friends and other processors. The improved cassava processing technologies identified in the study area includes mechanical grater, screw press, fryer, mechanized peeler and mechanical sifter. The major constraints encountered by the respondents include inadequate credit facilities, inadequate extension contact and high costs of cassava processing machines. This study therefore suggests that policy makers need to increase extension contacts services to create more awareness and increase the level of adoption among the cassava processors in Oyo State. It is also essential for cassava processors to form cooperative societies through which they can put their financial resources together for reinvestment and by that they can benefit from microcredit schemes to boost their cassava processing enterprise.

Keywords: Cassava processors, extension agents, improved processing technologies, sources of information.

Introduction

Agriculture plays a crucial role in the development of any nation, it helps in addressing economic hardship, food insecurity and poverty reduction in most developing nations (Osabohien and Urhie, 2017). It is regarded as the support of the Nigerian economy because it supplies food, raw materials and generate domestic income for most of the population. Agricultural production has contributed to foreign exchange earnings, government revenue and employment (Martin, 2017). The process of increasing the efficiency of agricultural production through agricultural modernization depends mainly on the extent to which farmers can incorporate improved agricultural practices (technologies) into their farming operations (Sasore, 2005). The importance of technology to agricultural development especially in less developed countries is widely acknowledged and cannot be overemphasized (Adesakin and Oluwatusin, 2017). Technology is the most important

factor that can contribute to growth in agricultural productivity. The use of technology in agriculture involves the application of technological innovations into production, storage, and processing of agricultural products to improve the efficiency (Abdoulaye *et al.*, 2014). Technology has made relevant contributions to national progress and its usefulness has attained universal recognition. In many developing countries including Nigeria, lack of appropriate technological and scientific knowledge application limits agriculture and economic progress (Suleman, 2011).

The availability of these innovations or technologies for agricultural processing is one step in the process of improved agricultural processing, the next and most important step is the adoption of these improved processing technologies by the farmers (Akinola *et al.*, 2010). The adoption of new technology is described as an innovation decision process



which an individual pass through from the time of first knowledge (awareness) of the innovation to a decision stage of either adoption or rejection and confirm the decision (Abdoulaye *et al.*, 2014). It is the stage in which farmers decides or agree to use a new technology. The adoption of any technology is dependent on the profitability of the technology, the risk and uncertainty associated with it, the initial capital requirement, socio-economic characteristics of the farmers and cultural/traditional belief systems (Ajala *et al.*, 2012). The increase in productivity associated with improved technologies can only be reaped if the farmers adopt the technology (Adesakin and Oluwatusin, 2017).

Cassava has become a basic raw material for many small-scale businesses such as cassava flour mills, bakeries, fast food firms, restaurants, gari processing firms and is currently an income generating activity (Adeoye *et al.*, 2018). Cassava is virtually grown in all parts of Nigeria with rainfall greater than 100mm and accounts for over 70% of the total production of tuber crops in Africa (Nwaobiala and Anyanwu, 2018). Nigeria has been recognized as one of the leading producers of cassava in the world since 2002 (FAO, 2015). Government intervention and the efforts of non-governmental organizations have led to several measures that support the production, processing and marketing of cassava. Through this effort appreciable progress has been made in the development of processing technologies and rural infrastructure (Onyemauwa, 2012).

However, Food and Agricultural Organization (2010) observed that in many developing countries, wide adoption of technology by farmers is quite limited. This may be due partly to lack of adequate information, since many of the farmers in developing countries live in the rural areas where they have inadequate sources of information. About 75% to 80% of Nigerians live in the rural areas relying on agriculture for their employment and yet spend high proportion of their income on food because of low production and processing level (Olomola, 2017). This situation is further worsened by food losses that occur because of inadequate processing facilities (Daud *et al.*, 2018). Poor processing equipment is a major cause of post-harvest

losses in the world with special emphasis on developing countries such as Nigeria (FAO, 2017). Cassava is the most perishable tuber crops and can deteriorate within two or three days after harvest. So, there is need to process it within the shortest time after harvest (NRCRI, 2012). There is also low level of access to and subsequent adoption of technological innovations particularly among women processors who also find some innovations difficult to maintain due to lack of maintenance ability, capital, limited authority for decision making (FAO. 2012) and skill training. Consequently, the levels of agricultural production in most developing countries remain low. Cassava processing is labour intensive, often characterized by low quality, low output per unit of time and full of drudgery. On the other hand, enhanced cassava processing could also lead to increased demand for raw cassava products thereby necessitating greater production (Adeoye *et al.*, 2018). This study was carried out to assess the adoption level of improved cassava processing technologies in Oyo state, Nigeria. Moreover, it attempted to examine the level of awareness, the sources of information and the major constraints militating against adoption of improved cassava processing technologies in the study area.

Methodology

The study was carried out at Ibarapa East local government area of Oyo state. It consists of two major towns Eruwa and Lanlante. The rainfall pattern in the area follows a tropical type with an average annual rainfall of 300mm and fairly high temperature with land mass area of 408,424sq/km. There two major planting seasons in the area. The early season usually beginning from March and end toward end of June, and the late season planting ends around December. The vegetation of the area is largely rainforest and savannah and this make it possible to cultivate a wide array of crops ranging from tree crops and arable crops. The common crops grown in the area include cocoa, oil palm and cashew while the arable crops include cassava, maize, yam and vegetables. Multi stage sampling procedure was used in selecting 190 cassava farmers in the study area. The local government was politically divided into two major towns i.e. Eruwa with 6 wards and Lanlate with 4 wards. Ibarapa East local government area was purposively selected, in the first stage, due to



its high cassava-farming population. In the second stage, a simple random selection of 4 wards in Eruwa and 2 wards in Lanlate while the third stage involved the random selection of 20 cassava farmers from each wards, giving a total number of 6 wards, and one hundred and twenty respondents that were used for this study.

Results and Discussion

Socio Economic Characteristics of Respondents

Table 1 described socio-economic characteristics of the respondents. The result showed that 10.53% of the respondents were between the ages of <30 while 53.68% were between the ages of 31-50 years. The mean age of the respondents was 47 years which shows that most of the respondent are within their productive years to utilize cassava processing innovations transferred to them. This agrees with the finding of Odebode (2008) who reported that perception and adoption of innovation is mainly associated with youthful and active age of the farmers. The result in Table 1 further showed that 8.42% of the respondents were single, 90.53% were married. In addition, 30.53% of the cassava processors had tertiary education; those who possessed secondary education were 38.93%, while those having primary education were 23.16%. Only a few (7.37%) of them had no formal education. This implies that many of the cassava processors will have right perception and adoption of innovations from extension agents on the importance and usage of the improved technologies. Sofoluwe *et al.* (2011) confirmed that education influences people's perception and adoption of innovations. Farmers that had secondary occupation were 64.21% while 37.79% had no secondary occupation. Household size shows that 2% had household size of less than four, 13% had 4-7 persons, and 66.3% had between 8-11 persons and 18.95% had household size above 11 persons with mean household size of 6 persons. This is similar to Adebayo *et al.* (2003) who reported an average household size of 7 persons. This implies that the larger the household size the more labour availability and the more income requirement to meet household needs. Table 1 also shows that many of the cassava processors (65%) did not belong to any cooperative association while only 35% belonged. The implication of this is that, these cassava processors might be deprived of some

of the opportunities and benefits which membership of cooperative societies may offer, which can boost their productivity, improve income and reduce poverty. Belonging to an organization such as a cooperative society enables farmers to have access to information, get input at cheaper cost, get extension services, and have profitable interaction /discussion and other intangible benefits that enhance efficiency and development in their production. This is related to the findings of Balogun *et al.* (2012), that most non-Fadama II members had lower agricultural production because they had no access to information on modern technology and inputs.

Table 1: Distribution of respondents according to socio economic characteristics

Socio-economic characteristics		Frequency	Percentage	Mean
Age (years)				
Less than 30	20	10.53	47	
31-40	56	29.47		
41-50	46	24.21		
51-60	40	21.05		
Above 60	28	14.74		
Marital status				
Single	16	8.42	9	
Married	172	90.53		
Divorced	2	1.05		
Family size (Persons)				
Less than 4	4	2.11	9	
4-7	24	12.62		
8-11	126	66.32		
Above 11	45	23.68		
Secondary occupation				
Yes	122	64.21	35.79	
No	68	35.79		
Educational status				
No formal	14	7.34	30.53	
Primary	44	23.16		
Secondary	74	38.95		
Tertiary	58	30.53		
Cooperative Society				
	67	35.26	100.00	
Yes	123	64.74		
No	190			
Total				

Source: Field survey (2019)

Cassava processing experience of respondents

Table 2 showed that 4.21% of the respondents had processing experience of less than 5 years, 49.47% had processing experience of between 6-10 years while 44.32% had processing experience of above



10 years. The mean number of years of processing experience was 11.42 years. This agrees with the findings of Bakut (2013) who asserted that farmers with long years of farming experience would be conversant with the constraints and this would increase their level of acceptance of new ideas as means of overcoming their production constraints. In addition, most of the respondents have their own enterprise (68.42%) and (32%) work in group.

Table 2: Distribution of respondents according to years of processing experience

Variation	Frequency	Percentage	Mean
Processing experience			
Less than 5	8	4.21	
6-10	94	49.47	
Above 10	88	46.32	11.42
Processing enterprise			
work in group	60	31.58	
Owned enterprise	130	68.42	
Total	190	100.00	

Source: field survey (2019)

Credit received, source and form of access by the respondents.

Table 3 showed that 66.32% of the respondents received credit while 33.68% of the respondents did not receive credit. This implies that majority of the respondents have access to credit. The result also showed that credit from cooperative was the highest 40.00%, followed by bank with 29.47%. About 1.05% had credit from relatives and friends, 23.16% had credit from their husband and 6.32% had credit from agricultural agencies. Majority of the respondents got their credit in form of cash while 20% of them got their credit in form farm input and they will be paying the money back gradually.

Table 3: Distribution of respondents according to the credit received, source and form of access by the respondents

Sources of credit	Frequency	Percentage
Obtained of credit		
Yes	126	66.32
No	64	33.68
Source of credit		
Husband	44	23.16
Bank	56	29.47
Co-operative	76	40.00
Relatives and Friends	2	1.05
Agricultural agencies	12	6.32
Form of access		
Cash	152	80.00
Input	38	20.00

Total 190 100.00

Source: field survey (2019)

Extension contact with the respondents

Result presented in the Table 4 showed that 64.21% of the respondents had no contact with the extension agent in the last one year and 35.79% of the respondents had contact from the extension agents in the last one year. Also, 11.58% of the respondents had extension contact once in a year, 15.79% had the visit twice in a year and 8.42% had the visit thrice in a year. This implies that the extension contact in the study area were inadequate. Hence, they may not take up the adoption of the new technologies.

Table 4: Distribution of respondents according to their assess to the extension contacts with frequency of visit

Extension contacts	Frequency	Percentage
No	61	64.21
Yes	34	35.79
Frequency of visits in a year		
Once in a year	11	11.58
Twice in a year	15	15.79
Thrice in a year	8	8.42

Source: Field Survey, 2019

Awareness of identified improved cassava processing technologies

Table 5 showed that 100% of the respondents were aware of the mechanical grater.100% were aware of the screw press; 85.26% were aware of the fryer (toaster), 75.79% were aware of Mechanized peeler and finally 100% were aware of mechanical sifter. The mechanical grater, mechanized sifter and the screw press having 100% awareness imply that all the respondents were aware these technologies.

Table 5: Distribution of respondents according to the level of awareness of identified improved cassava processing technologies

Processing Technologies	Frequency	Percentage
Mechanical grater	190	100.00
Screw press	190	100.00
Mechanical sifter	190	100.00
Fryer(toaster)	162	85.26
Mechanized peeler	144	75.79

*Multiple responses



Sources of information on improved cassava processing technologies

Table 6 showed that 21.05% of the respondents got information on cassava processing from friends and relatives, 31.58% from fellow processors, 5.26% from radio, 7.37% from television and 7.37% from extension agents. This implies that the fellow processors are the major source through which information was disseminated to the people in the study area.

Table 6: Distribution of respondents according to their sources of information on improved cassava processing technologies

Sources of information	Frequency	Percentage
Relatives and friends	52	27.37
Extension agent	14	7.37
Radio	10	5.26
Television	14	7.37
Sales agent	40	21.05
Total	190	100.00

Level of adoption of improved cassava processing technologies

Table 6 showed that the mechanical grater had the highest adoption level of 100%. This was followed by the screw press which had the adoption level of 100% and 1.05% of the respondent adopted mechanical peeler. Finally, the mechanical sifter and the fryer (toaster) had the adoption level of 100% and 0 %respectively. The reason for the very low adoption level of the fryer (toaster) and mechanical peeler might be that the respondents prefer using the old and traditional method of frying gari, also to provide job opportunity and financial constraints. The average level of adoption is 60% and this implies that the level of adoption of the improved cassava processing technologies is above average, but this can still be improved if all the identified improved technologies adopted.

Table 7: Distribution of the respondents according to level of adoption of improved cassava processing technologies

Machines	Frequency	Percentage
Mechanical grater		
Agree	190	100.00
Disagree	0	0.00
Screw press		
Agree	190	100.00
Disagree	0	0.00
Mechanical sifter		
Agree	190	100.00
Disagree	0	0.00
Fryer(toaster)		
Agree	0	0.00
Disagree	190	100.00
Mechanical peeler		

Agree	2	1.05
Disagree	188	98.95

Source: Field Survey, 2019

Production level of the respondent

Table 7 showed that 9.48% of the respondents were producing within the range of 11-15 bags per day and 37.89% of them were producing within the range of 6-10bags. Also, 43.16% were producing less or equal to 5bags while 9.48% of the respondents produce above 15bags. This showed that the respondents had low production rate due to lack of some machineries and the mean production was 7 bags per day. The table also showed that majority of the respondents (97.89%) had no weighing machine and only 2.11% of the respondent had the weighing machine. Respondents that sold their products above ₦7000 were 33.69% while 57.89% of the respondents sold their products within the range of ₦6100 - ₦7000.

Table 8: Distribution of respondents according to the production of the respondent

Production	Frequency	Percentage	Mean
Number of bag(s)/day			
Less than 5bags	82	43.16	
6-10bags	72	37.89	
11-15bags	18	9.48	7bags
Above 15bags	18	9.48	
Weight of the bag			
None	186	97.89	
65kg	4	2.11	
Price per bag(₦)			
Less than 6000	16	8.42	
6100-7000	110	57.89	
above7000	64	33.69	₦7001
Total	190	100.00	

Constraints to adoption of improved cassava processing technologies

Table 8 showed the constraints encountered by the respondents in the adoption of improved cassava processing technologies. The result revealed that inadequate credit facilities ranked top on the list of constraints. Inadequate credit is a major problem for the processors because without adequate funding they cannot fully adopt improved technologies thereby leading to reduction in their



productivity. Inadequate extension contacts were ranked second. The table also shows that high cost of machine and bad access road ranked third and fourth respectively. There is also high cost of transportation in moving their produce to market. In addition to that, the improved cassava processing machines are so expensive that most of them cannot afford it, so they spend a lot of money in transporting their products to the processing centers where they go in search of hired machinery.

Table 9: Distribution of respondents according to constraints to adoption of improved cassava processing technologies

Constraints	Frequency	Percentage	Rank
Inadequate credit facilities	182	95.79	1
Inadequate extension contacts	160	84.21	2
High cost of machines/equipment	134	70.53	3
Bad access road	102	53.68	4
High cost of transportation	95	47.37	5
High cost of cassava tuber	28	14.74	6

Conclusion and Recommendations

Based on the findings of this study, it is evident that majority of the cassava processors were married, had post primary school education with larger household size and high processing experience but many do not belong to any cooperative society. It was also revealed that many of the cassava processor sourced their information on the improved cassava processing technologies from friends and other processors because they had few records of extension visits. The level of awareness was high with 60% level of adoption of the improved cassava processing technologies while the adoption of mechanical peeler and fryer were very low in the study area. The major constraints encountered by the respondents include inadequate credit facilities, inadequate extension contact and high costs of hiring cassava processing machines etc. This study therefore suggests that policy makers on cassava processing sector need to increase extension contacts to create more awareness and increase the level of adoption of the improved cassava processing technologies among the processors in Oyo State. Also, the extension services on improved cassava processing technologies should be intensified in the study area. The

study also recommended that the cassava processors should form cooperative societies through which they can put their financial resources together for reinvestment and by that they can benefit from microcredit schemes to boost their cassava processing enterprise.

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